

New Innovation: UGM Lecturer Creates Multifunction Electronic Tongue


Tuesday, 28 January 2020 WIB, By: Ega Zulfikar



A Lecturer from Faculty of Mathematics and Natural Science UGM who at once is a researcher at Institute of Halal Industry and System (HIS) UGM, DR. Eng. Kuwat Triyana, M.si., has a remarkable triumph over developing a multifunction tool which works to validate halal authentication, detect the authenticity and expeditious, accurate, and portable food product qualities in a form of electronic tongue or ELTO.

“This tool can be used as a method for attesting the authenticity of food products, such as civet coffee and Zam Zam, detecting product contamination and its halal legal, expeditious detecting the narcotics and etc. Similarly working like human’s tongue, elto can analyze any taste, such as bitter, salty, sour, sweet, and savory.” Said Kuwat to the reporters at a press conference in Material Physics and Documentation Laboratory (Fismatel), Department of Physics, Faculty of Mathematics and Natural Sciences UGM on Friday (1/17).

Elto is created by some prior components such as taste sensor array as the working electrode, reference electrode, acquisition data system, and artificial intelligent system which is wirelessly connected to the computer or Android smartphone. This tool is claimed as the smallest electronic tongue that exists nowadays. To support the protability, this tool uses one 3.500 mAH lithium battery as the energy sources which is convinced can last up to 14 hours for continuous use.



The operation ways of this device is quite convenient. Dissolve or brew the sample of product which is going to be detected using water or alcohol depends on the sampel characteristics. Next, dip the tip of the sensor array into the solvent sample for 1-2 minutes. After that, data is being processed based on artificial intelligence until the decision is taken from the result of its sample.

“The result can be seen in the computer screen or Android device in no more than 2 minutes whether the product is original, halal, and in a particular quality level or not,” he said.

Apart from being able to detect efficiently, this tool is also has high accuracy for more than 98 percent. This tool has other benefits such as, it is portable and can connect wirelessly to Android device and computer. These benefits can be considered as considerable points to distinct this tool with other existed tools in the market. Besides, this tool can be connected to the network which definitely making it possible to be brought and used directly everywhere based on IoT for attesting.

“Other tools which has existed in the market, foreign products have big dimensions as a table size, so that it is not possible to be moved from one place to another easily. While the accuisition system from elto has size dimension 105x73x35 mm,” he said as he explained if elto has been calibrated and verified in a laboratory of one university in Braganca Portugal.”

Elto was developed since 2016 with total Rp 200 million spending money. It was made by the students team from UGM Physics graduate programs, namely Shidiq Nur Hidayat, Trisna Julian, and Aditya Rianjanu. It is currently in a patent process and eliminated frpm PT. Swayasa Prakasa. The target standarization for this year and 2021 can be run and producted en masse for particular applications.

“If it has been producted en masse, the price can be cheaper than before. If the import product which is sold in the market estimated for Rp. 2.5 billion per unit, the elto is only Rp 25 million or less,” said the lecture from Physics Department.

Not only to detect the originality of the product, but elto is also capable to detect the quality of product. For instance in a black tea and cocoa, it can be known whether the quality is considered to premium level, medium, or low. Besides, it can be used as halal detector as in gelatin and other contaminations in food or cosmetic products. This tool is also tested to be able for detecting narcotics in which the development of its tool will be supported and collaborated with Mabes Polri.

“In the future, we will keep improving the tool, not only for food industry but also for the importance of medical diagnosis and pharmacy industry, such as detecting the use of drugs, gorilla tobacco, paralyzed withered, detection of other diseases, and other things depend on the trained usage of its

tool,” said Kuwat Triyana. (Humas UGM/Sasa)

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